

THE LIBRARY MEDIA CENTER: TOUCHSTONE FOR INSTRUCTIONAL DESIGN AND TECHNOLOGY IN THE SCHOOLS

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Perhaps...the school media specialist will become an instrumental player in this transformation [of teachers' roles], an instructional designer from within.

(Gustafson, Tillman, & Childs, 1991, p. 460)

Echoing a goal that has long been held by the school library media field, these authors capture both the promise and the uncertainty that characterize any fond hope. In fact, many scholars and other leaders in the field have been vocal champions of a strong relationship linking the library media specialist, various learning technologies, and instructional design; however, the realities of life in the public schools have presented serious obstacles to the full flowering of this relationship. Today, as at other periods in the evolution of the library media field, internal and external changes affecting the school environment suggest that the library media specialist is poised to assume a much more active role as an instructional designer/instructional technologist than has been possible in the past. Understanding the nature and history of the field will enable school library media professionals and others to make a realistic assessment of the opportunities that lie ahead and to devise strategies to take advantage of them.

This chapter discusses the history of the role of the library media specialist since the field began to emphasize a design-and-technology focus in the 1960s; the various instructional design models created specifically for library media specialists to use in the schools; the nature of the library media specialist's role today, particularly as it relates to instructional design and

technology; the accumulated research on the impact of library media programs on student learning and achievement; and the issues related to instructional design and technology that are likely to engage school library media researchers in the near future. The chapter is intended to provide a wide-ranging context for a consideration of the issues the library media field faces in the early twenty-first century and to lay a realistic yet sanguine foundation for its future progress in the areas of instructional design and technology.

18.1 SOME "EARLY" HISTORY: 1960–1989

The nature of the long and often challenging evolution of the school librarian from a provider of services and materials into a central member of a school's instructional team has had a profound effect on the roles, responsibilities, and image of the library media specialist today. The history of that evolution is tied inextricably to the official standards and guidelines for the field, a set of documents dating to the 1920s that over the years have served a dual purpose: to describe the library media specialist's roles and responsibilities in the periods in which they were

written and to urge the field forward toward an ever-increasing degree of professionalism in the periods to follow. A brief review of the modern editions of those documents (i.e., those published since 1960) provides an overview of this evolutionary process as it has played out during the post-Sputnik decades that have seen both technology and the library media specialist's instructional role grow more and more important in the schools.

The field's first three sets of standards were published in 1920, 1925, and 1945. Since at least the publication of the fourth set—*Standards for School Library Programs*, released by the American Association of School Librarians (AASL) in 1960—library media specialists have been expected to serve as instructors as well as librarians. The professional role has included not only helping teachers select appropriate learning materials (including the “audiovisual materials” newly mentioned in the 1960 standards) but also working collaboratively with teachers to integrate library skills into ongoing classroom instruction. There is no question that the “information specialist” aspect of the role reigned supreme at that time and remains prominent to this day. However, it is important to note that school librarians—now library media specialists—have spent decades taking on increasing responsibility for providing instruction and for integrating technology into the curriculum as well as for providing library services.

The publication of *Standards for School Media Programs* (AASL & DAVI, 1969) ushered in the widespread use of the terms “media” and “media specialist” and gave increasing emphasis to the library media specialist's instructional role. This fifth set of standards—the first set jointly prepared by AASL and what would one day become AECT—signaled an important confluence of the two major foci of the field, librarianship and educational technology. Now, the “library girls” and the “AV boys” officially joined forces and became “library media specialists”; the issues, cultures, and expertise of the two areas have remained intertwined ever since. The 1969 *Standards* formally established for school library media practitioners and theorists alike the view that the library media program is the center of instructional design and technology activity within the school. For the most part, however, this recognition has been at the theoretical level, as professional practice has struggled to keep pace with professional aspirations.

The sixth set of national standards, *Media Programs: District and School* (AASL & AECT, 1975), provided a further step in the evolution of the library media specialist as an instructional technologist and designer. These guidelines “elevated the curricular and instructional role of the school library media specialist and began to specify the requirements of such a role” (Cleaver & Taylor, 1989, p. 5), charging library media specialists with such tasks as:

- Initiating and participating in curriculum development and implementation
 - Designing in-service education
 - Developing materials for self-instructional use by learners for specified objectives . . .
 - Determining the effectiveness or validity of instructional materials and sequences.
- (*Media Programs . . .*, p. 7, cited in Cleaver & Taylor, 1989, p. 5)

The years following the release of *Media Programs . . .* saw an explosion of publications related to the instructional design role of the library media specialist. In what has become known as the primer on the topic, Margaret Chisholm and Don Ely published *Instructional Design and the Library Media Specialist* in 1979. This slim volume both provided a rationale for the new role and described how it should be practiced by the library media specialist. The book also set the tone for much of the writing that followed:

The process of instruction will continue into the future, and those who are active in its design are those who will survive. . . . It is possible that many of the functions which are now performed by traditional librarians and audiovisual specialists can be handled by clerks and technicians. . . . Therefore, in order to justify a professional position, it is incumbent upon library media professionals to use the talents which they have to become active members of the instructional team. (p. 6)

Although Chisholm and Ely's predictions seem unremarkable—even quaint—in hindsight, they were visionary at the time. For many current library media specialists, achieving these authors' vision is still a struggle.

18.2 INSTRUCTIONAL DESIGN MODELS FOR LIBRARY MEDIA SPECIALISTS

After 1975, the question became, how would library media specialists rise to the new opportunities and mandates presented to them? While the field's leaders and professional organizations touted the importance of instructional design, there was little guidance for practicing library media specialists who wished to take on the designer's role. In 1982, for example, Turner surveyed all library-education programs in the United States that were accredited by the American Library Association and found that a substantial number had no instructional design requirements for their school library media students.

In the early 1980s, several authors tackled the details of helping practitioners use the methods and techniques of instructional design in the schools—notably Kerry Johnson (1981), Philip Turner and Janet Naumer (1983), and Betty Cleaver and William Taylor (1983). The first two sets of authors looked to traditional instructional design models and developed variations that were tailored to the needs of the library media specialist; the third developed a contextual model that offered guidance about implementing the overall design process. All three of these earliest models assumed that the library media specialist had a basic role in providing access to, and assisting teachers and students with, the technology of the day. Perhaps even more importantly, all three assumed that the library media specialist would work in collaboration with teachers—not as an individual designer who presented teachers with finished products. Today, over 20 years later, these central assumptions persist: the library media specialist is to use the concepts and skills of instructional design to integrate technology into instruction and to serve as a member of instructional teams that form and dissolve according to the needs of teachers and the curriculum.

18.2.1 The SID Model

Johnson (1981) noted that “The library media specialist as instructional developer has not been specifically considered in [instructional design] model development” (p. 257) in any of the dozens of models that were then in the instructional design literature. His solution was SID (the School Instructional Development model), which he created to “describe instructional development in terms appropriate to the role of school library media specialist” (p. 271). Johnson identified three general stages—define, design, and evaluate—and provided details related to each in both graphic and narrative forms (Fig. 18.1). The boxes and lines of the graphic make it look like a typical instructional design model, and both the illustration and its accompanying narrative include specific guidance for the library media specialist. The graphic notes the “sources of curriculum” that underlie the development of an “ideal component outline,” for example, while the narrative explains that “It is the major role of the library media specialist during this [project selection] stage of the project to elicit from the teacher all possible approaches to the instructional problem at hand and to encourage creative thinking” (p. 259).

Johnson intended his sophisticated model to be “a framework within which the library media specialist can operate” (p. 271). He noted, however, that its successful use assumes several key factors: the willingness of library media specialists to

become designers and the adequacy of their educational preparation for the role. He further “posits the condition that principals and teachers are equally aware and supportive of the library media specialist’s proactive role” as an instructional designer (p. 271). Over the years, all three of Johnson’s assumptions have proven problematic, as other school personnel’s understanding of the library media specialist’s once-new role has continued to lag.

18.2.2 The Turner Model

Two years after Johnson’s model appeared, Turner and Naumer noted that the library media specialist “who has accomplished the transition to this role [of instructional design consultation with teachers] is in a distinct minority. Most school library media specialists seem either never to have chosen to pursue this expanded role or to have soon become frustrated in the attempt” (p. 29). To remedy this situation, Turner and Naumer offered their own eight-step instructional design model (Fig. 18.2) and expanded upon its basic elements to suggest the appropriate level of involvement for the library media specialist at each step. Identifying four levels—involvement, passive participation, reaction, and action/education—the authors provided an ingenious and pragmatic guide for library media specialists to follow in using instructional design in a staged and gradual

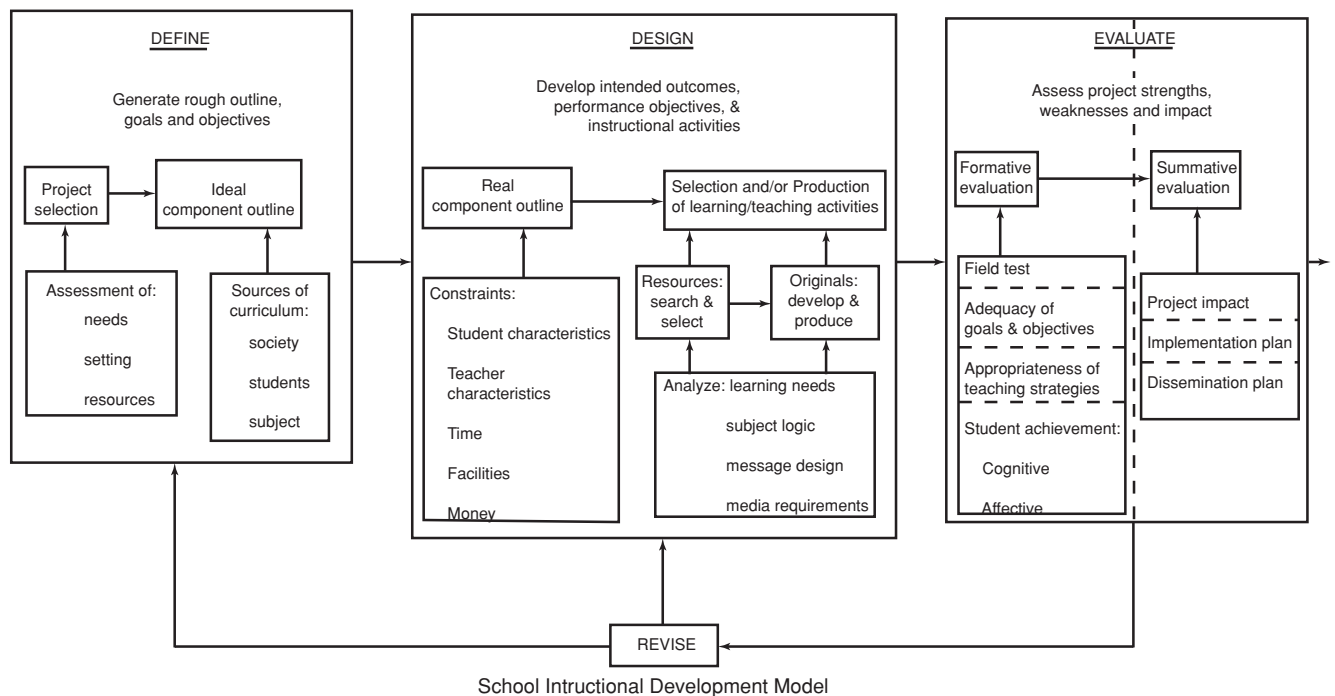


FIGURE 18.1. Johnson’s School Instructional Development Model (SID). Reproduced by permission of the American Library Association from “Instructional Development in Schools: A Proposed Model,” by Kerry A. Johnson, from *School Library Media Quarterly*, vol. 9, p. 270; copyright © 1981 by the American Library Association.

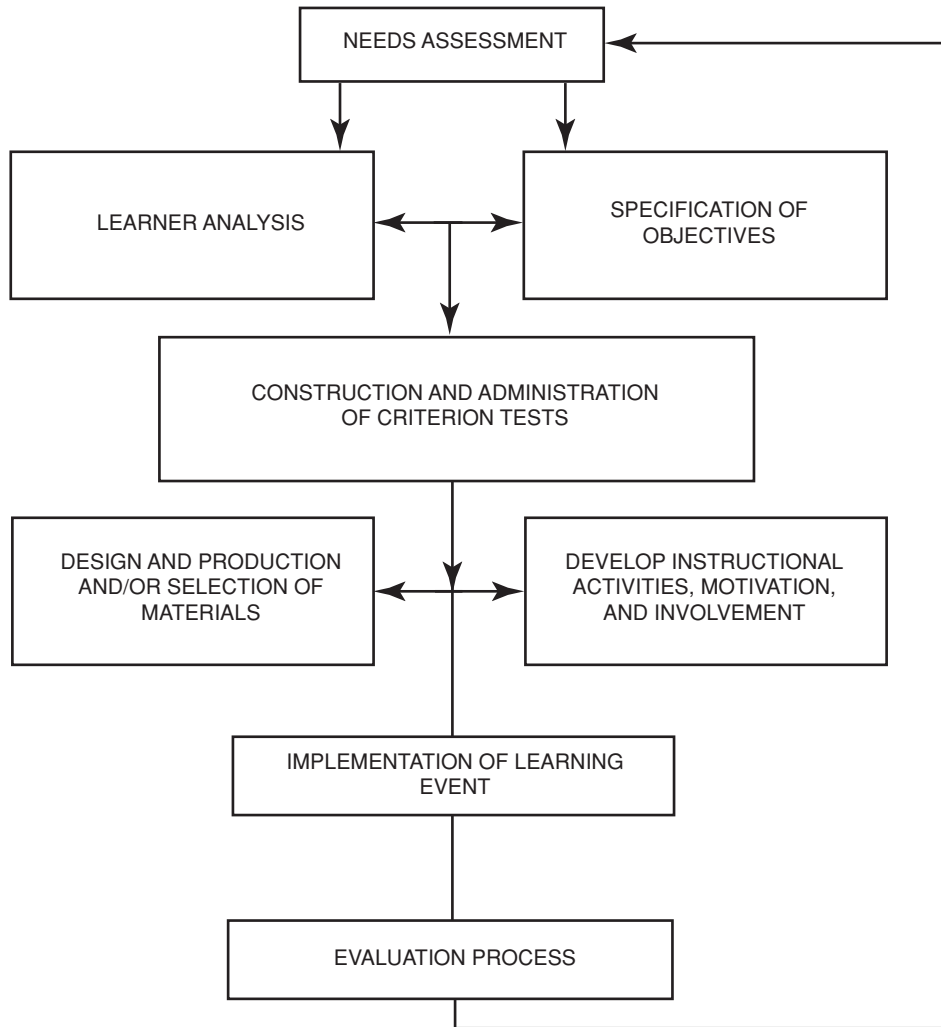


FIGURE 18.2. Turner and Naumer's Instructional Development Model. Reproduced by permission of the American Library Association from "Mapping the Way Toward Instructional Design Consultation by the School Library Media Specialist," by Philip M. Turner and Janet N. Naumer, from *School Library Media Quarterly*, vol. 10, p. 30; copyright © 1983 by the American Library Association.

way. Perhaps even more importantly, they provided a theoretical structure that offers relief from the perception that instructional design is an overwhelming, perhaps unconquerable, task for anyone to attempt in the schools.

In 1985, in his textbook based on the 1983 article, Turner described each of the four levels of involvement as follows:

1. No Involvement. Perhaps no intervention is required. Perhaps the teacher has not requested involvement by the center. Perhaps the library media specialist is unwilling or unable to intervene.
2. Passive Participation. This level . . . involves little or no interaction between the library media specialist and the faculty member. The library media specialist selects and maintains materials, equipment, and facilities which assist the faculty member in implementing a particular step.
3. Reaction. As a teacher performs a particular step, he/she may randomly request some sort of assistance. . . . This intervention would be informal and not designed to increase the teacher's ability to perform a step more effectively at a later date.
4. Action/Education. This level . . . most closely resembles formal instructional design consultation as described in the literature. . . . the library media specialist often works as part of a team, implementing a number of the steps in the instructional design process. The library media specialist might present an inservice on one or more of the steps. Often the purpose of involvement at this level is to increase the teacher's ability to perform one or more of the steps subsequent to the intervention. (Turner, 1985, p. 15)

Not surprisingly, in the original article Turner and Naumer discouraged library media specialists from adopting the

“No Involvement” level at any step. They argued that “*all levels, except the very lowest, be considered involvement in the instructional design consultation process*” [italics in original] (p. 30). For each step of their design model, they provided a brief definition of the step, succinct descriptions of the levels as they apply to that step, and a series of sample activities that illustrate how each level might be attained. Step 2, Specification of Objectives, for example, is defined as “Derives terminal and enabling objectives from goal statements, identifies as to type of learning and arranges in a learning hierarchy.” The Reaction level for this step involves “Upon request, assists in any aspect of creating and using objectives,” while the sample activity states that “After being informed by the Principal that her objective, ‘The students will *really* understand the value of good citizenship,’ was not adequate, the new social studies teacher asked for help. The [library media specialist] helped her re-write the objective” (p. 31).

Testimony to the value of Turner and Naumer’s contribution to the library media specialist’s evolving design role is provided by its uniqueness and longevity: Turner’s book, based on the 1983 model, has remained for many years the sole text on instructional design developed specifically for the library media field. Originally published in 1985, it was revised and reissued in 1993. While the “levels” idea remained, several of the levels were renamed and slightly reconceptualized: in-depth, moderate, initial, and no involvement. The essential structure and

content of the model, however, remained unchanged. Turner continues to write on the topic (Turner, 1991; Turner & Zsiray, 1990) and plans a new edition of *Helping Teachers Teach* for 2003.

18.2.3 The TIE Model

Like the Johnson and the Turner and Naumer works, the Cleaver and Taylor (1983) model “attempts to bridge the gap between theory and practice” (Cleaver & Taylor, 1989, p. ix) for the library media specialist attempting to adapt to the designer’s role. In contrast to the models described above, however, Cleaver and Taylor focus primarily on how the library media specialist can fold instructional design into his or her many other responsibilities within a school. Thus, their TIE model (Fig. 18.3) does not address the specific concepts and principles of instructional systems design but “gives the school library media specialist a structure for the process of initiating cooperative planning with a teacher.” The focus of the model is on “helping the library media specialist to examine, step-by-step, the processes of his or her interactions” (p. ix) as he or she establishes a cooperative relationship with a teacher, works through the process of instructional planning with that teacher, and implements and evaluates the results of the effort. The TIE model—Talking, Involving, Evaluating—complements and enriches Johnson’s and Turner and Naumer’s work.

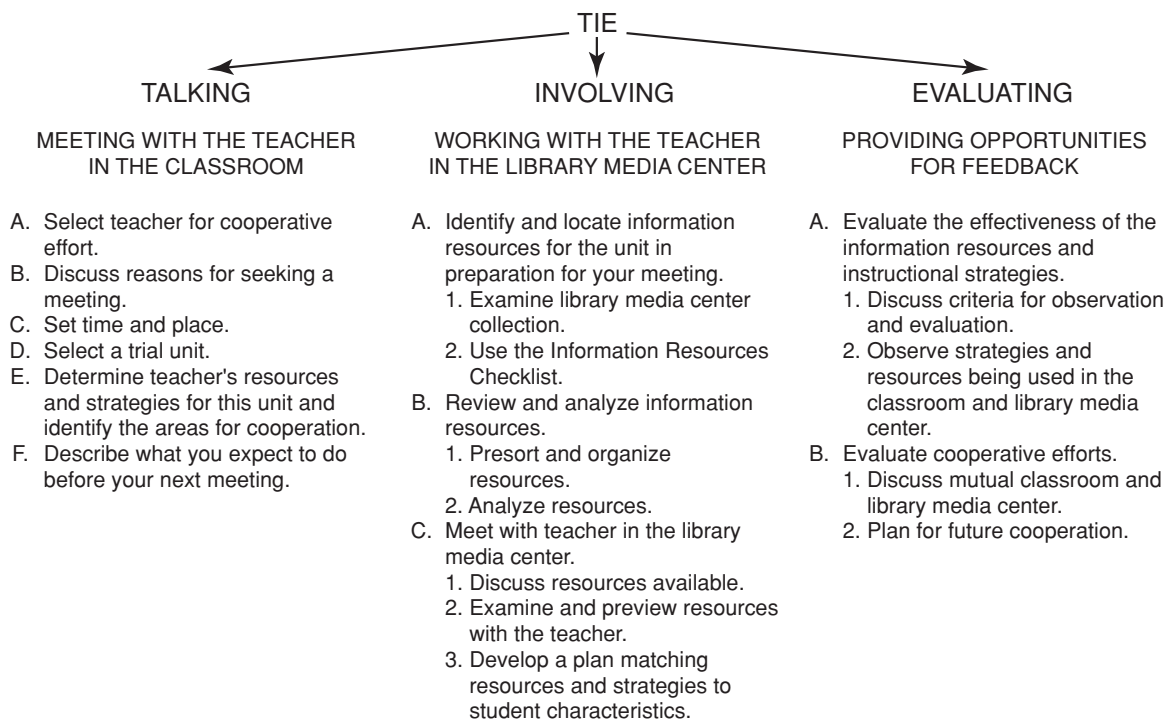


FIGURE 18.3. Cleaver and Taylor’s Talking-Involving-Evaluating Model (TIE). Reproduced by permission from *The Instructional Consultant Role of the Library Media Specialist* by Betty P. Cleaver and William D. Taylor; copyright © 1989 by the American Library Association.

Out of print for several years, the book explaining the TIE model was reissued in 1989. Honed by the authors' experiences conducting staff development workshops with library media specialists in Ohio, the revised edition provides extensive guidance for each of its steps and includes a number of ancillary documents designed to meet the needs the workshop participants had identified. For example, a Curriculum Awareness Checklist is provided to help library media specialists be proactive rather than reactive in initiating the instructional design process; an Information Resources Checklist is included to help remind them of sources for the materials they might need to support the materials selection part of that process. Advice includes tips for choosing a teacher—one “who has a reputation for being an effective classroom teacher, a teacher regarded highly by students and other teachers” (p. 32) who will be skilled and secure enough to enhance the chances of a successful cooperative effort. Advice for selecting a trial unit includes descriptions of the Ho-Hum Unit, the Undernourished Unit, the Student Involvement Unit, the Mandated Unit, the Expanded Unit, and the New Unit—any one of which is likely to be improved by an infusion of cooperative instructional design. Clearly, the authors were determined to provide direct and specific help for the library media specialist who was willing to attempt what Turner and Naumer (1983) had identified as a potentially frustrating experience.

18.3 THE FIRST INFORMATION POWER: THE 1988 GUIDELINES

It is no accident that the revised and expanded TIE model was issued in the wake of the publication of the seventh national standards for the school library media field: *Information Power: Guidelines for School Library Media Programs* (AASL & AECT, 1988). A landmark document for the field, these standards—now known as *Information Power 1*—broke new ground in many ways that are beyond the scope of this chapter. However, the reappearance of the TIE model a year after the guidelines' publication is a clear example of the excitement the new document spawned about the library media specialist's instructional design role. In fact, it is difficult today to overestimate the influence of *Information Power 1* on the emergence and solidification of that role.

18.3.1 Mission and Goals

According to these guidelines, the mission of the library media program was “to ensure that students and staff are effective users of ideas and information” (AASL & AECT, 1988, p. 1). Library media specialists were to accomplish that mission not only by helping teachers select and use appropriate resources but by providing intellectual and physical access to information. Library media specialists were to offer instruction related to the use of information and to work with other educators “to design learning strategies to meet the needs of individual students” (p. 1). Two goals related to the overall mission further delineated the key relationship between the library media program and the

field of instructional design and technology. These goals called upon the library media specialist

To provide learning experiences that encourage students and others to become discriminating consumers and skilled creators of information through introduction to the full range of communications media and use of the new and emerging information technologies [and]

To provide leadership, instruction, and consulting assistance in the use of instructional and information technology and the use of sound instructional design principles. (AASL & AECT, 1988, p. 2)

The position of these statements within the overall context of *Information Power 1* is in itself significant: they are the third and fourth of seven goals listed in the document—appearing immediately after the goals dealing with the provision of intellectual and physical access to information, the most obvious of the library media specialist's functions. Their prominence within the document underlines the unquestioned importance of instructional design and technology to the leaders in the library media field by this point in its history. After years of moving toward a full instructional role in the school, the field was now staking a claim to what would become the central focus of education in the 1990s and beyond—helping students and others learn how to use informational/instructional technology for learning.

18.3.2 Roles of the Library Media Specialist

Information Power 1 highlighted its claim by formally identifying three distinct roles for the library media specialist: information specialist, teacher, and instructional consultant. The first two roles, of course, were nothing new: library media specialists had always been their schools' information specialists and had long been expected to teach library skills. Although the document noted that “the importance and complexity of this [information specialist] function have increased dramatically in recent years” (AASL & AECT, 1988, p. 27) and that the teaching of “information skills” now involved helping students to develop skills in critical thinking and “to become effective producers and users of media” (p. 33), little in the updated descriptions of these roles was totally unfamiliar to the document's audience. The formal specification of the role of instructional consultant, however, was another matter: a stunning innovation in the field's national guidelines and a direct and purposeful call to library media specialists to adopt a new and greatly enlarged role within their schools. *Information Power 1*'s anointing of library media specialists as instructional consultants is arguably the most significant contribution of this set of standards to the progress of the field.

18.3.3 Instructional Consulting

As an information consultant, the library media specialist was now expected to use “a systematic process” to

contribute to the development of instructional activities in the school by participating in the design, production, implementation, and

evaluation of complete instructional units. Throughout the instructional development process, library media specialists [are expected to] assist classroom teachers with the following tasks:

- developing unit objectives that build viewing, listening, reading, and critical thinking skills and that respond to student needs, as determined by a formal assessment process;
- analyzing learner characteristics that will influence design and use of media in an instructional unit;
- evaluating present learning activities and advising appropriate changes;
- organizing the instructional plan, indicating when, where, how, and by whom activities will be presented;
- examining and identifying resources that may be helpful in teaching the unit;
- identifying materials that must be produced locally and or adapted from other materials, within copyright guidelines, and determining how they will be developed;
- identifying logistical problems that must be addressed in order to implement the instructional plan;
- securing equipment, materials, and services required to implement the learning unit;
- assisting in the delivery of unit content and activities;
- determining types of assessment, especially when learning alternatives include various types of media; [and]
- evaluating and modifying learning activities, based on feedback gained from observation and interaction with students. (AASL & AECT, 1988, p. 36)

Wittingly or unwittingly, the writers of *Information Power 1* had developed their own instructional design model for the field.

18.3.4 Theory and Rationale

Information Power 1 did not appear in a vacuum, of course, and its focus on the two instructional roles of the library media specialist—teacher and instructional consultant—reflected the writings of a number of leaders who were intent on moving the field to a more integral place within the schools' instructional programs. In a 1982 special issue of the *Wilson Library Bulletin* devoted to the library media center, David Loertscher had touted instructional development as a “second revolution” in the emergence of the library media field, one which was a “natural extension of the role of the library media specialist” (p. 417). This special issue also introduced Loertscher's 11-level scheme describing successive levels of the library media specialist's involvement in the school's instructional program. At each of its levels, the taxonomy assumes that the library media specialist will be involved in providing, selecting, and/or promoting the use of audiovisual materials—the instructional technologies of the time; levels nine and ten, however, speak specifically to the library media specialist's involvement in instructional design:

Level Nine—Instructional design, level I: the library media specialist participates in every step of the development, execution, and evaluation of an instructional unit, but there is still some detachment from the unit.

Level Ten—Instructional design, level II: the library media center staff participates in grading students and feels an equal responsibility with the teacher for their achievement. (Loertscher, 1982, p. 420)

Acknowledging that the differences between the two levels are subtle, Loertscher (1982) explained that in both levels the library media specialist “works with teachers to create the objectives of the unit, assembles materials, understands unit content, and participates in the instructional process.” The latter level also involves the library media specialist as “a coequal teacher not only as a resource person but also as an evaluator of student progress” (p. 420). A conceptual framework rather than a specific instructional design model like Johnson's (1981) and Turner's (1983), Loertscher's taxonomy rapidly became influential and joined with these others in helping to create an environment in which the library media specialist's instructional consultant role could be successfully promoted. Loertscher's 1988 book—*Taxonomies of the School Library Media Program*, which grew out of his 1982 article—remained an important resource for the field throughout the 1990s.

One especially significant piece from this era—written, in fact, while *Information Power 1* was under development—was Mancall, Aaron, and Walker's (1986) “Educating Students to Think: The Role of the School Library Media Program.” In this concept paper resulting from a 1985 meeting sponsored by the National Commission on Libraries and Information Science, the authors reviewed then-current learning theory and tied it to the library media specialist's instructional role, advancing a compelling argument for the library media program's centrality in this arena. They wrote that “Library media specialists . . . realize that a major part of their time must be spent helping students develop the thinking skills that will equip them to not only locate but also evaluate and use information effectively and thereby become information literate.” The article also noted that among the “primary functions performed by the library media staff that contribute directly to the development of these skills” are “materials production, student instruction, and instructional development activities” (p. 19). Overall, the piece had a major influence not only because it articulated the theoretical grounding for the library media specialist's instructional consultant role but also because it introduced the idea of “information literacy” to the field. It is considered a classic today.

18.4 BARRIERS TO INSTRUCTIONAL CONSULTING

Cautionary notes had been sounded even before *Information Power 1* appeared. In a 1987 special issue of the *Journal of Instructional Development* devoted to the question of instructional design and the public schools, Schiffman hypothesized that “School library media centers represent a viable means of gradually infusing [instructional design] theory and practice into public education” (p. 42) but posed a number of questions about the library media specialist's assumption of the instructional consultant role:

Anyone familiar with the demands placed on school library media specialists . . . knows that their role as instructional consultants is vastly overshadowed by the management and clerical responsibilities required to keep a resource center operating smoothly. The tendency to schedule school library media centers with classes most of the day . . . bites into most of the remaining time that might allow for instructional design activities. Furthermore, school library media specialists have generally not been trained in instructional design skills . . . beyond those required for media production. (Schiffman, 1987, p. 2)

Schiffman's caveats—other responsibilities, inflexible scheduling, and inadequate training—are recurring themes in the library media specialist's evolution into a fuller instructional role (see, for example, Baumbaugh, 1991; Craver, 1986, 1990; Small, 1998b).

In the years following the publication of *Information Power 1*, numerous writers chronicled the stumbling blocks in that evolution. Craver—whose series of important publications (1986, 1990, 1994) have both traced the evolution of the library media specialist's instructional role and envisioned its potential at various stages in this evolution—noted in 1990 “a clear pattern of disagreement between the contemporary literature, standards, and actual practice” that persisted throughout the 1980s and suggested that “the instructional consultant role visualized by practitioners and researchers [that had] preceded the 1988 standards” had by that point “evolved into . . . a reaction to educational changes brought about by technological advances” rather than solidifying into a distinct role in its own right. Indeed, she concluded that “there is little evidence to suggest that this new role has been accepted and is being practiced by the majority of librarians—despite the numerous books and articles that have discussed it” (pp. 11–12). Eisenberg and Brown (1992), reviewing studies of library skills instruction in K–12 settings, reinforced Craver's view: they found considerable interest in the library media specialist's instructional role but little research in support of the assumptions and acclamations of its value that fill the literature of the field.

Pickard (1993), in a small survey that was limited to library media specialists in a single county ($N = 83$) but that echoes Schiffman's insights, found that a large majority of her respondents agreed with the importance of the instructional consultant role but that “The library media specialists were not practicing [that] role to any great extent. In fact, fewer than half reported that they were practicing to a great or very great extent the actual instructional design levels of Loertscher's taxonomy” (p. 119). In one of the most widely published studies from this period, Putnam (1996) echoed Pickard's design and methodology in a national survey of library media specialists in elementary schools ($N = 197$) and found similar results. Using an 18-item questionnaire designed to capture respondents' perceptions of various aspects of the library media specialist's overall role, she asked them to use a Likert-like scale to rate each item (1) for its importance to the profession and (2) for the degree to which they implemented it in their daily practice. Overall, “with only one exception, all statements rating actual work practice had means lower than the means for perceived importance to professional role, and the mean differences were significant . . . at the .05 level” (p. 46). For the purposes of this paper, it is

interesting to note that two of the four statements relating to the library media specialist's role in instructional design garnered top-half ratings for their importance to the profession but none was ranked higher than eleventh in the responses related to actual practice.

Perhaps the most telling insight into the effectiveness of the library media specialist's instructional consulting role in the 1980s and early 1990s came from outside the library media field. Martin and Clemente (1990), in an article that purported to explain “why ISD has not been accepted by public schools” (p. 61), never discuss the role—actual or potential—of the library media specialist in infusing the concepts and processes of instructional design into public education. Never mentioning the library media specialist at all, the article suggests that the authors—and by extension, many others—were unaware that such a role existed or was mandated by the library media field.

18.4.1 Flexible Scheduling and Instructional Collaboration

Library media researchers, of course, began to look for reasons that the key new role promoted by *Information Power 1* had failed to materialize. Putnam (1996) and others have suggested that the culprit behind the lack of the full implementation of that role is the way in which library media center offerings are often scheduled. Under “fixed scheduling,” which is still widely practiced throughout the country, library media specialists teach “library” classes or supervise groups of students' use of resources regularly throughout the school week and have little (if any) opportunity to collaborate with teachers—who often use the students' time in the library as the planning period to which they are entitled by contract. Under “flexible scheduling,” the scheduling pattern endorsed by the profession as a whole, students still use the library regularly—however, “The library media specialist and the teacher plan together for instruction or use of resources based on student learning needs in each curriculum unit and schedule on that basis. The schedule is arranged on an *ad hoc* basis and varies constantly” (van Deusen & Tallman, 1994, p. 18).

The issue of fixed vs. flexible scheduling has been a staple of professional discussions for well over a decade. Van Deusen's (1993) survey of 61 Iowa library media specialists nominated by their supervisors as “effective [professionals] whom . . . they would rehire based on performance” (p. 174) provided some of the earliest research on the issue. Her *t*-tests comparing the independent variable “schedule” to a series of specific instructional design tasks (gather, design, collaborate, deliver, evaluate) revealed that library media specialists who were flexibly scheduled were statistically more likely to participate in the evaluation of students' work and that, moreover, “scheduling and teachers' planning styles interacted significantly to produce more curriculum involvement when flexible scheduling and team planning were implemented together” (p. 173). Van Deusen concluded that successful instructional consulting occurred in elementary schools in which flexible scheduling joined with a “culture of planning” to create an environment in which meaningful collaboration between teachers and the library media specialist could occur.

Reporting on a national survey of elementary school library media specialists ($N = 362$) that echoed her earlier methodology and was funded by the 1993/94 AASL/Highsmith Research Award Study—a well-respected research grant available through the American Association of School Librarians—van Deusen and Tallman confirmed and expanded these earlier findings. After participants had identified instances of five types of curriculum consulting in which they had participated over a 6-week period—gather, identify, plan, teach, and evaluate—the researchers used a variety of descriptive statistical techniques as well as a series of ANOVAs to determine the relationships among scheduling, consulting, information skills instruction performed by library media specialists, specific aspects of the planning process, and a variety of other variables (e.g., full- and part-time status of the program, requirements to provide planning time for teachers, etc.). In an issue of *School Library Media Quarterly* devoted primarily to the three parts of this study the authors wrote that

Library media specialists in schools that used fixed scheduling defined slightly more than one-fifth of their units as collaboratively planned. In contrast, those library media specialists in schools that used flexible scheduling defined slightly more than three-fifths of their units as collaboratively planned. Perhaps the best scenario for implementation of the consultation and teaching roles defined in *Information Power* includes flexible scheduling, with a full-time certified library media specialist who meets with teams of teachers to plan for instruction. (van Deusen & Tallman, 1994, pp. 36–37)

McCarthy (1997) confirmed these and Putnam's (1996) findings through a survey of library media programs in 48 schools in the New England region. She found that the second-ranked barrier to the full realization of the vision of *Information Power 1*—after the predictable “lack of support for budget, resources, technology, and staff”—was the “lack of a flexible schedule to allow for collaborations” (p. 209). Whatever the reasons, it was clear that, almost a decade after the publication of the 1988 guidelines that had formalized the instructional consultant role, library media specialists supported the role but were not practicing it to the extent to which it could make a difference in their contribution to student learning.

18.4.2 The Library Power Project

One exception to this general pattern was uncovered during the Library Power Project, a 3-year effort funded by the DeWitt Wallace–Reader's Digest Fund launched in 1988. With almost \$50 million in support from the Fund, Library Power involved 19 communities across the country in the largest school library media project ever funded. “Designed to promote the full use of the school library program in instruction” (Hopkins & Zweizig, 1999, p. i), the project sought to surmount the barriers to the full implementation of the vision of *Information Power 1* by (1) stocking newly refurbished facilities with up-to-date resources, (2) ensuring adequate staffing by full-time library media specialists, (3) requiring flexible scheduling, (4) supporting collaboration among teachers and library media specialists, and (5) offering professional development. Using a mixture of

survey and case-study approaches, project evaluators addressed a wide range of questions. What Webb and Doll (1999) found from their content analyses of data from over 400 schools (i.e., “collaboration log forms” completed by library media specialists and questionnaires completed by a variety of school personnel) was that

participation in Library Power increased the percentage of schools where teachers and librarians collaborated to plan instruction and to develop the library collection. Library Power also apparently increased the percentage of teachers who collaborated with the librarian in schools where collaboration already existed. (Webb & Doll, 1999, p. 29)

While such a finding is hardly surprising—participants simply did what the grant money funded them to do—it is notable that the barriers to instructional consulting that have been cited by other researchers can, in fact, be removed. Van Deusen's most recent study on the topic (1996) suggests that vast sums of money are not the only mechanism for engineering such a removal. Using traditional qualitative methods—interviews with teachers, the principal, and the library media specialist; observations of planning sessions and of instruction; analysis of various documents, including email messages related to planning; and analysis of a checklist on which teachers identified the roles the library media specialist tended to play in their teams—van Deusen investigated the library media specialist's contributions to teaching teams in a new elementary school “designed and staffed to feature collaboration” (p. 232). She identified three categories of assistance the library media specialist provided: gathering and presenting resources, planning and focusing teaching and learning experiences, and serving as a communication link among the teams and the other instructional specialists in the school.

Ultimately, van Deusen concluded that the library media specialist worked effectively with all four of the school's teaching teams, functioning as an “insider/outsider” who was able to participate fully as a member of each team while at the same time using her status as someone with neither teaching responsibilities nor authority over the teachers to serve as “a catalyst for reflective thought” (p. 245). Many of the conditions in the school seemed ideal for fostering the collaboration she found: a resource-based curriculum, a commitment “to create for itself an identity as a community” (p. 232), “a high priority for the use of instructional technology” (p. 235), and a library media specialist who had been a successful classroom teacher. Once again, her findings suggest that the culture of the school—which is analogous to the environment enabled by the Library Power funding—is the most important variable in determining the library media specialist's effectiveness in the instructional consultant role.

18.5 RESEARCH ON THE LIBRARY MEDIA PROGRAM'S IMPACT ON LEARNING

One can argue that the library media specialist's instructional design role has been largely overlooked because library media programs have been largely unconnected with learning—that,

despite the field's protestations, library media centers are largely "circulation depots" that are generally removed from the classroom and that library media specialists focus only on delivering "containers" of information rather than on designing instruction that helps students learn from the information in those containers. While it is undoubtedly true that many well-documented barriers have prevented library media programs from fully meeting the field's current expectation that "The library media program is essential to learning and teaching and must be fully integrated into the curriculum to promote students' achievement of learning goals" (AASL & AECT, 1998, p. 58), it is also true that the widespread perception that library media programs are removed from the schools' instructional mission is an inaccurate stereotype. In fact, research suggests that library media programs have had a steady, if small and little-documented, impact on student learning over the years.

18.5.1 Early Studies

As early as 1984, Elaine Didier's analysis of 38 studies of library media programs' impact on student achievement revealed a number of positive findings. Although the review is plagued by the problems endemic to any such "meta-analysis"—variations in definitions of achievement (GPA, test scores, problem-solving ability); in samples (elementary through postsecondary students); and in areas studied (primarily those like language arts that are usually associated with library media services but with scattered findings in such other areas as mathematics and the natural sciences)—the patterns that emerged allowed Didier to conclude in a later article that "Overall, the findings show much evidence that school library media programs can be positively related to student achievement" (Didier, 1985, p. 33). The studies indicated that the presence of library media programs, knowledge of library skills, and levels of library media service in a school were all associated with both general and specific improvements in achievement. Interestingly, while some of the studies in Didier's review addressed the curricular and instructional roles of the library media specialist, these were more descriptions of the barriers to implementing those roles than examinations of their effectiveness. Nevertheless, Didier's review makes it clear that for decades researchers in the field have held the assumption that the instructional role is an important component of library media programs that relates them directly to student learning.

Despite the positive trends in Didier's findings, she was able to muster only minimal evidence for library media programs' effectiveness in fostering learning. This is not surprising: Lance (1994) noted that fewer than forty studies had focused on the topic by the mid-1990s and that the majority of these had been conducted between 1959 and 1979. Many in the field "know" that library media programs are valuable in fostering learning and can point to individual studies and experiences to buttress that view, but little widespread and rigorous research has been conducted to support such claims. The fact that the calls for the library media specialist's instructional consulting role didn't appear in the field's official guidelines until the late 1980s both offers a reason for the dearth of studies before that period and

suggests that it is now time to conduct more extensive research into the relationship of the library media specialist's instructional and instructional consultant roles to student learning.

One of the first current library media researchers to investigate that relationship was Ross Todd, who conducted a series of studies in Australia over a period of several years and found that "integrated information-skills [instruction] can add a positive dimension to learning" (Todd, 1995, p. 133). Reporting specifically on the culminating study in this series, Todd described one of the few experimental attempts to investigate the connection between the library media specialist's instructional role and student achievement: a posttest-only comparison group study that took place over three terms and involved 40 high school students who'd received traditional science instruction and 40 who'd received instruction in information seeking as part of the science curriculum. Analyses of variance of students' mean annual science scores (based on marks from their midyear and final exams) and of mean scores on an information-skills test devised by the research team led Todd to conclude that "integrated skills instruction appears to have had a significant positive impact on students' mastery of prescribed science content and on their ability to use a range of information skills" (p. 137). This finding that the library media specialist's instruction in information literacy improved students' achievement not only in the information skills but also in content knowledge was an important and tantalizing step in the field's quest to state with confidence that its programs and services have a direct and positive effect on learning.

18.5.2 Learning with Information

In the past decade, various other library media researchers have also worked mightily to capture the elusive relationships among the library media program, the library media specialist's instructional and instructional consultant roles, and student learning. Although much of this work has simply *assumed* the importance of information use to learning rather than actually testing the relationship, the stream of writing in this area deserves attention in any discussion of research on library media programs' role in student achievement. In fact, it is obvious today that the theories and arguments underlying the literature on information use and learning must be a key component undergirding any future research on the impact of library media programs on learning.

18.5.2.1 Resource-Based Learning. Throughout the 1990s, researchers and theorists associated with the resource-based learning movement (also known as the information-based learning movement) sought to demonstrate the benefits of a kind of learning that was grounded in students' direct use of information—that is, in their use of original sources and reference materials to answer self-generated questions (see, for example, Eisenberg & Small, 1995; Meyer & Newton, 1992; Ray, 1994). Their ideas (1) that students' personal questions are more important than teachers' packaged assignments and (2) that information is a more valuable tool for learning than textbooks and other traditional learning tools are obviously

consistent with constructivist learning theory. Moreover, the emergence of this stance within the library media field marked an important stage in the field's movement toward a specific focus on learning and in its understanding that library media programs have an essential role in fostering authentic, meaningful learning.

18.5.2.2 Learning as Process. Other library media researchers also began to use ideas from contemporary learning theory and to focus less on information retrieval and more on the cognitive dimensions of using information as the basis for learning. Moore and St. George (1991), for example, used think-alouds and retrospective interviews with 23 sixth graders in New Zealand to explore the cognitive demands that libraries place on children. McGregor (1994a, 1994b) used participant observation, interviews, think-aloud protocols, and document analysis to investigate the higher-order thinking skills that gifted Canadian twelfth graders in two classes (English and social studies) brought to bear during the process of finding information for three research papers. She found that students thought intuitively rather than in any planned way, that they thought at all levels of Bloom's taxonomy during the process, that they were product-oriented as they sought to complete their projects, and that the nature of the question they were asked (i.e., factual or analytical) had an effect on their levels of thinking about the information they encountered.

Pitts (1994) also used qualitative methods—observation, interviews, and the examination of documents—in a study funded by the 1993–94 AASL/Highsmith Research Award to investigate how and why 26 eleventh- and twelfth-grade science students in a Florida high school made decisions about seeking and using information for a video documentary on a topic related to marine biology. Pitts concluded that the students' learning experience consisted of four intertwined "learning strands"—life skills, information seeking and use, subject matter, and video production—and that they employed these strands differentially according to the immediate task at hand as the research project progressed. Unfortunately, the students' "limited mental models" related to all four strands and the lack of systematic support for any of them from the teachers and library staff involved in the project conspired to limit the students' success.

More recently, McGregor and Streitenberger (1998) used qualitative methods to look at students' understanding of the relationship between learning and the everyday details of the research process. Todd (1999) used a quasi-experimental, repeated-phases design to examine the way information use changed the cognitive models of four above-average Australian girls in their last year of secondary education. In this study, Todd elicited and mapped the girls' initial knowledge structures about heroin and then repeated this process after each of three exposures to different information about the drug. He found that the students used three different strategies—appending new information to an existing node, inserting new information between two existing nodes, and deleting nodes—as they integrated the new information into their original structures: "Overall, the predominant change to the girls' knowledge structures was through elaborating a more inclusive, general idea

through set membership, providing more specific layers in the hierarchy of ideas" (p. 21).

All these studies presume a focus that is grounded in the core ideas that spawned information-based learning—that is, they assume that the learning that is important to investigate involves the processes students use to identify questions, interact with a wide range of resources and information, and generate their own answers. This focus on the processes of learning with information rather than only on the outcomes of those processes marked a significant advance in library media researchers' contributions to the understanding of library media specialists' instructional role.

18.5.2.3 Learning and Electronic Information Sources.

For years, a smattering of information science researchers investigating students' use of electronic resources for information retrieval have drawn implications for learning from their findings (e.g., Kafai & Bates, 1997; Liebscher & Marchionini, 1988; Marchionini, 1989; Marchionini & Teague, 1987; Solomon, 1993, 1994). Others have gone beyond looking at electronic information resources only as venues for information retrieval or for fostering skills directly related to that retrieval to investigate them specifically as learning resources (e.g., Crane & Markowitz, 1994; Kuhlthau, 1997; Neuman, 1993, 1995, 1997). While this research thread remains minor within the information science field, questions about the relationship of information seeking and learning with the products and services available today—particularly those on the World Wide Web—seem to be entering the field almost by osmosis. Recently, for example, Bilal (2000, 2001) used response-capturing software and exit interviews to examine seventh graders' cognitive behaviors as they searched for information to answer a specific question—How long do alligators live in the wild and how long in captivity—on Yahoo!igans! Among other things, she found that students' search processes "showed an interaction between the concrete cognitive operational stage and the formal cognitive operational stage" (p. 660) and that their navigational prowess had a greater impact on their success as searchers than "factors such as reading ability, topic knowledge, or domain knowledge" (p. 661).

Fidel involved seven of her graduate students in a class project to use observations, think-alouds, and interviews to study eight high school students' Web-searching behaviors in connection with their homework assignments (Fidel et al., 1999). The group was unavoidably drawn into questions about learning when they encountered the students' many problems in completing their searches and tried to determine how to make the students' experiences more successful: "the team's first and strongest recommendation is to provide teachers and students with formal training in Web searching. . . . without such training, the introduction of the Internet into schools will not help to improve learning and may even help some students to develop unproductive learning habits" (p. 34).

To date, the work of Large and his colleagues offers the most intensive and extensive look at information use and learning in electronic environments from an information science perspective. For approximately a decade, this group has studied sixth graders in primary schools in the Montreal area as they

have used various electronic information technologies—first a CD-ROM encyclopedia and, later, the Web. Their two series of studies have been multiphased and comprehensive, using experimental and qualitative methods to look at a variety of aspects of interface and information design, students' searching, and the kinds of learning associated with working in this environment. The first series, funded by the Social Sciences and Humanities Research Council of Canada, comprised three phases:

- Phase 1 involved 120 students and compared their abilities to recall information and draw inferences from it after using either the print or the CD-ROM version of *Compton's Multimedia Encyclopedia* (Large et al., 1994b).
- Phase 2 involved 71 students and examined their abilities to recall and enact a procedure presented under various conditions, including several involving animation and captioning, in the same encyclopedia (Large et al., 1995).
- Phase 3 involved 122 students and further investigated the effects of animation and captioning and added a focus on spatial skills in an overall attempt to determine the specific factors that enhance students' abilities to recall text and to comprehend it (Large et al., 1996).

A related study that was not actually a part of the three-phase work (Large et al., 1994a) compared 48 students' retrieval steps and times when looking at questions of varying complexity in the print and CD-ROM versions of the encyclopedia.

All these investigations used experimental designs and a variety of analytic techniques. The first-published study (Large et al., 1994a) randomly assigned the students to two equal groups and had each student retrieve text to answer four questions in either the print or the CD-ROM version of the encyclopedia in a randomized sequence over two searching sessions. The questions ranged from simple (involving one key term) through various stages of complexity (involving two, three, or four key terms). Most students (75%) were able to retrieve the appropriate text from whichever source they searched, and analysis of variance revealed that both groups took seven times longer to retrieve the text containing the answer for the most complex question than the text related to the simplest one. Students in the CD-ROM group used one or more of the three search paths offered by the interface and exhibited a wide range of retrieval times to find their answers.

The studies that comprised the three phases of the larger investigation changed in both complexity and focus as the work progressed. All the studies, however, were interested in the contributions of animation to students' recall and comprehension and were heavily influenced by work found in the instructional design literature (e.g., Hannafin & Rieber, 1989; Reiber, 1990; Rieber & Hannafin, 1988). Each involved the establishment of various numbers of randomly assigned groups (five in Large et al., 1994b, and four in each of the other two studies) that viewed the same semantic content under different presentation conditions—each involving text alone and then a variation of additional conditions depending upon the particular focus of the study. Data analysis involved a variety of techniques, including multivariate repeated measures analysis of variance for all the

studies and additional measures as appropriate—for example, Large et al. (1996) also involved the analysis of taped interviews.

As might be expected, the findings for the collection of studies are wide-ranging and various. The following highlights review the findings that seem most germane to the focus of this chapter:

- Students shown the text-only version of the CD-ROM version of the encyclopedia did better on the measure of literal recall of content than either (1) students who saw printed text and illustrations or (2) those who saw multimedia (text, still images, and animation). However, the "multimedia subjects did significantly better than their print or text-on-screen counterparts at this deeper level [drawing inferences]. The animations, then, appeared to help subjects better understand the topics" (Large et al., 1994b).
- While recall and inference levels were similar for the four groups in this study, recall of procedural information—that is, of a sequence of executable steps—was highest in the group that saw the richest presentation: text plus animations plus captions (Large et al., 1995).
- While animation did not have any effect on students' recall and understanding of descriptive text—that is, of text that describes persons, events, and processes related to a common theme—it had a significant effect on students' ability to perform a problem-solving task, the task in the study that "involved the highest level of cognitive effort." Moreover, "Students with high spatial ability in general performed better than students with low spatial ability regardless of presentation condition" (Large et al., 1996, p. 437).

For their next series of studies—another 3-year effort supported by the Social Sciences and Humanities Research Council of Canada—Large and his associates used qualitative methods to explore in depth some of the issues related to children's searches of multimedia CD-ROMs and the World Wide Web. Again using sixth graders from the Montreal area, the researchers investigated students' search strategies, information extraction, and use of information for assignments in both environments and elicited their suggestions for Web design. While this series of studies is less targeted to learning than the earlier series, it nevertheless adds to the growing amount of data available to the designers of these resources that could help them create products that are more suitable for younger users (Large & Beheshti, 2000; Large, Beheshti, & Breuleux, 1998; Large, Beheshti, & Rahman, 2002).

Large and his collaborators are unique in the breadth and depth of their studies of the relationship of information seeking and learning, and they stand almost alone in presenting such findings in the information science literature. Others in the field who are working on similar problems include Chung (2003)—who has used qualitative techniques and concept mapping to identify connections between information seeking in various library media center resources, including electronic ones, and learning at each of the six levels in Anderson and Krathwohl's (2001) revision of Bloom's taxonomy—and Neuman (2001), who argues that synthesizing—the process of creating a

personal conceptual structure from information elements found in discrete electronic resources—is the key to learning with the World Wide Web.

18.5.2.4 Kuhlthau's Information Search Process (ISP).

One indication of the importance of emerging ideas about the relationship of information to learning was the appearance of the inaugural issue of *School Libraries Worldwide* (Oberg, 1995), which was devoted entirely to the topic. Carol Kuhlthau was invited to write the lead article in that journal both because her work in the area is considered seminal and because her Information Search Process (ISP) has found wide acceptance not only within school library media but within the larger field of library and information science.

Kuhlthau (1983) initially identified the ISP in a library media setting through a qualitative study in which she identified the cognitive, affective, and physical dimensions of 25 advanced high school seniors' information seeking as they worked on research papers. Over the years, she has verified the model through a series of related studies: with "process surveys" of a broader population of 147 high school seniors in six sites (Kuhlthau, 1989); with similar surveys of 385 academic, public, and school library users in 21 sites (Kuhlthau et al., 1990); and with two longitudinal studies of her original participants after their college graduations (Kuhlthau, 1988a, 1988b). In *Seeking Meaning: A Process Approach to Library and Information Services* (Kuhlthau, 1993), she argued that both learning and information seeking are constructivist processes and that "information seeking in libraries [should be] placed in a larger context of learning" if library and information science theorists are to overcome "a lack of theory within library and information science to explain fully the user's perspective of information seeking" (pp. 14–15).

Although Kuhlthau's original intent was to illuminate information seeking rather than learning—indeed, the ISP doesn't include the word "learning" at all—her interweaving of information seeking and learning has been deeply influential throughout the library media field. She captured what the field believes to be its core contribution in schools, and she has expanded and explained her ideas in a variety of forums. In 1993, for example, she identified "zones of intervention" during which library media specialists could apply practices related to Vygotsky's theory to help their students in various stages of the ISP; in 1997, she presented an adaptation of the model for use in electronic environments; in 1999, she was invited to participate in the Library Power Project to analyze the effects of that effort on student learning.

18.5.3 Learning and Library Power

One of a cadre of researchers involved in evaluating the Library Power Project, Kuhlthau (1999) was asked to address the question of "learning in the library," only one of many questions of interest to the project as a whole. Designed to assess the extent to which the project achieved its primary goal—that is, to improve "opportunities for learning" rather than to assess learning itself—the overall Library Power evaluation component

reflected the traditional library science approach to assessing the value of library services by focusing on the nature and extent of the opportunities provided rather than on the actual results achieved. Despite this limitation, Kuhlthau was able to tease out several findings that are relevant to learning in school library media centers.

Working with responses to a single open-ended question about learning on each of three years of annual surveys of all Library Power librarians ($N = 405$) and with data from case studies of learning in three Library Power schools, Kuhlthau identified five levels of learning:

Level 1: Input—emphasis on what librarian did, not on students, i.e., adding to collection, adding new technology, describing lesson or unit plan.

Level 2: Output—emphasis on quantitative measure of student use, i.e., more visits, more use of materials and technology.

Level 3: Attitude—emphasis on change in student attitude, i.e., increased interest and enthusiasm.

Level 4: Skills—emphasis on location of resource and use of technology, i.e., locating books, using CDROM encyclopedia.

Level 5: Utilization—emphasis on content learning, i.e., using resources to learn through inquiry in content areas of the curriculum. (Kuhlthau, 1999, p. 83)

Focusing on the fifth level—"the most pertinent level of evaluation for addressing the question of impact on student learning" (p. 92)—Kuhlthau cataloged a number of indicators of learning identified by the librarians on the survey. The most frequent of these—"independence in applying skills"—accounts for about 20% of the 251 of these responses (62% of the 405) that included any descriptive statement related to learning; indicators related to documented evidence like final products, "recalls content at a later time," and test results accounted for only 15% (39 responses). Case-study data—analyzed according to the same levels noted above—revealed that the three schools had various levels of success in fostering learning and that the most successful was School 1, where "the librarian was a full partner with teachers in learning through research" (p. 94). Able to answer only "a qualified 'yes' that Library Power has influenced student learning opportunities" (p. 94), Kuhlthau pointed out that many of the library media specialists had been "grappling with the task of identifying and assessing learning related to use of library resources. . . . This study suggests further expertise was needed for assessing, evaluating, and documenting the learning related to libraries" (pp. 87–88). The fact that this expertise was lacking suggests, once again, that the concepts and techniques of instructional systems design had not yet permeated library media specialists' understanding of their instructional role.

18.5.4 The "Colorado" Research

Against the background of this limited research into the effectiveness of library media programs, the task of demonstrating any robust or widespread relationship between such programs and learning fell to Keith Curry Lance and his colleagues. Lance's group and others who adopted their methodology conducted a

series of studies that “have confirmed a positive relationship between library media programs and student achievement virtually across the United States: the two ‘Colorado’ studies (Lance et al., 1993; Lance, Rodney, & Hamilton-Pennell, 2000b) and the studies in Alaska (Lance, Hamilton-Pennell, & Rodney, 2000), Oregon (Lance, Rodney, & Hamilton-Pennell, 2001), Pennsylvania (Lance, Rodney, & Hamilton-Pennell, 2000a), and Texas (Smith, 2001) that are based on the ‘Colorado’ methodology” (Neuman, 2003, p. 505).

For the first of these studies, Lance drew a nonrandom sample of 221 Colorado public elementary and secondary schools that (1) had library media centers that had responded to a 1989 survey of library media centers in Colorado and (2) used either the Iowa Tests of Basic Skills or Tests of Achievement and Proficiency to assess student achievement. He applied a combination of statistical techniques to data from (1) the 1980 U.S. Census about each district that had a school in the sample and (2) building-level files from the Colorado Department of Education (where he is the Director of the Library Research Service) in order to identify the relationships of 23 independent variables to students’ academic achievement as measured by the Iowa tests. Following an approach that might best be characterized as “peeling the onion,” he used first correlational analysis, then factor analysis, then path analysis conducted through multiple-regression techniques to determine the relationship of specific variables to student achievement. The first two methods provided a way to combine and reduce the original set of variables to nine: a “community” variable (the “at-risk” factor); three “school” variables (teacher-pupil ratio, per-pupil expenditures, and a combination of salary and other teacher data he labeled the “career teacher” factor); and five “library media center” variables (a “library media specialist role” factor and factors related to the library media center’s size, use, computing facilities, and per-pupil expenditures). The third method—path analysis—resulted in the ranking of the variables as predictors of student achievement.

Not surprisingly, the “at-risk” factor emerged as the strongest direct predictor of that achievement. Among all the other variables, however, the library media center ones were found to be the most powerful—even more powerful than other “school” predictors:

- The size of a library media program, as indicated by the size of its staff and collection, is the best school predictor of academic achievement.
- Library media center expenditures predict the size of the library media center’s staff and collection and, in turn, academic achievement.
- The instructional role of the library media specialist shapes the collection and, in turn, academic achievement.
- Library media center expenditures and staffing vary with total school expenditures and staffing.
- The degree of collaboration between library media specialist and classroom teacher is affected by the ratio of teachers to pupils.
- The other potential predictors analyzed during the study—the career teacher, library media center use, and library media center computing factors—were not found to have significant relationships to student achievement. (Lance, 1994, p. 172)

These were extraordinary findings, and so the “Colorado study” swept the school library media field. Most significantly for the purposes of this paper, it is important to note that many of the findings—particularly the third and the fifth—relate specifically to the library media specialist’s roles as teacher and/or instructional partner; we must also note that the final finding suggests that library media specialists’ use of instructional technology, at least computer technology, was either lagging or had not yet borne fruit. (Lance has since postulated that his initial work failed to take into account networked computers that tapped into library media center resources but were not physically housed in the library media facility.) In any case, drawing from across his data, Lance ultimately concluded that “Students whose library media specialists played [an instructional] role tended to achieve higher average test scores” (p. 172).

Criticized for its small sample size, its reliance on existing (rather than original) data related to both demographics and achievement, and its nonexperimental design, the first “Colorado study” nevertheless provided new insights into the relationships of library media programs and learning. Lance specifically called for replications of his work in other states, and later, in the 1990s and into the current century, he and others have drawn on his methodology to conduct such replications across the country. These later studies have generally included greater numbers of schools, original data as well as available data, and variations on Lance’s original study design. While they have continued to reinforce the importance of the instructional role of the library media specialist, they have found additional predictors of academic achievement as well: not surprisingly, for example, the library media center’s provision and use of technology, especially the Internet, has emerged as a major predictor.

Invited to the White House Conference on School Libraries on June 4, 2002, to present an overview of his work—including several studies that are currently underway—Lance identified three sets of findings about library media center factors that predict academic achievement that figure prominently across the studies he’s conducted in recent years:

- the *level of development* of the school library,
- the extent to which school librarians engage in *leadership* and *collaboration* activities that foster information literacy, and
- the extent to which instructional *technology* is utilized to extend the reach of the library program beyond the walls of the school library. (Lance, 2002, p. 2; italics in original)

The first of these factors relates primarily to physical issues: “the ratios of professional and total staff to students, a variety of per student collection ratios, and per student spending on the school library.” The second two, however, relate directly to the library media specialist’s role in instruction and in the use of technology for learning. According to Lance, library media specialists who exercise leadership in creating a collaborative environment in which they perform such functions as “planning instruction cooperatively with teachers . . . and teaching students both with classroom teachers and independently” (p. 4) have a direct effect on students’ higher reading scores. Additionally, “Perhaps the most dramatic changes since the original Colorado study have been in the realm of instructional technology. . . . In

our recent studies, we have found that in schools where computer networks provide remote access to library resources, particularly the Web and licensed databases, test scores tend to be higher” (p. 5).

The importance of this series of studies is that it establishes—for the first time—a clear and widespread connection between library media programs and learning. Moreover, since all the studies have included a mechanism to control for such “school differences” as teachers’ characteristics and total per pupil expenditures and such “community differences” as poverty and minority demographics, the connection is difficult to dismiss. Overall, the pattern that has emerged, while still based on correlational data rather than experimental findings, is strong enough to allow Lance to claim that “School libraries are a powerful force in the lives of America’s children. The school library is one of the few factors whose contribution to academic achievement has been documented empirically, and it is a contribution that cannot be explained away by other powerful influences on student performance” (pp. 6-7).

18.6 THE CURRENT NATIONAL STANDARDS AND THE LIBRARY MEDIA SPECIALIST’S ROLE TODAY

It is no accident that Lance couches his most recent findings in language taken directly from the latest national guidelines for school library media programs, *Information Power: Building Partnerships for Learning* (AASL & AECT, 1998). That document identifies “collaboration, leadership, and technology” as the three “integrating issues” that “underlie the vision of library media programs presented” there (p. 47). Lance’s (2002) focus on these subtle but significant elements reflects the field’s belief that a focus on these issues is imperative:

Collaboration, leadership, and technology [bold in original] are integral to every aspect of the library media program and every component of the library media specialist’s role. They furnish theoretical and practical grounding both for the program and for all the activities of the library media specialist. . . . They suggest a framework that surrounds and supports the authentic student learning that is the goal of a successful, student-centered library media program. (AASL & AECT, 1998, p. 49)

All three of these themes relate to the library media specialist’s role in instructional design and technology, and both the theoretical and the practical thrusts of *Information Power 2* leave no doubt about the current understanding of that role. For example, the document retained the same mission statement as *Information Power 1* and modified the goals only insofar as necessary to update them to reflect current language and emphases. Thus, the third and fourth goals now argue that the role of the library media specialist is

To provide learning experiences that encourage students and others to become discriminating consumers and skilled creators of information through comprehensive instruction related to the full range of communications media and technology [and]

To provide leadership, collaboration, and assistance to teachers and others in applying principles of instructional design to the use of instructional and information technology for learning. (AASL & AECT, 1998, p. 7)

Concepts and suggested practices related to these goals as well as to collaboration, leadership, and technology are embedded throughout the guidelines.

18.6.1 Today’s Library Media Specialist

While the general thrust of *Information Power 2* remains the same as that of its predecessor, the document reflects some significant changes in the field’s understanding of the library media specialist’s overall role for the new century and its “information age.” Acknowledging the library media specialist’s substantial responsibilities in the areas of program management, budgeting, staff supervision, and resource acquisition and maintenance, the new guidelines elevate “program administrator” to the library media specialist’s fourth official role. And bowing to the field’s continuing dislike of the term “instructional consultant” because of its negative connotations, the guidelines substitute the phrase “instructional partner” for this function. No longer having to explain away their own reservations about the separateness inherent in the word “consultant” and the concerns of teacher colleagues who bridled at the notion of superiority implied by the term, library media specialists can more easily assume a collaborative stance—joining “with teachers and others to identify links across student information needs, curricular content, learning outcomes, and a wide variety of print, nonprint, and electronic information resources” (AASL & AECT, 1998, p. 4).

Two other changes in role descriptions from earlier standards documents are also important to note. First, in *Information Power 2*’s listing of the four roles now prescribed for the field, “teacher” is listed first; “instructional partner,” second; “information specialist,” third; and “program administrator,” fourth. The committee that prepared the guidelines have been adamant that their intent was not to diminish the traditional “information specialist” role but to highlight the importance of the two instructional roles in an age in which “Core elements in both learning and information theory . . . converge to suggest that developing expertise in accessing, evaluating, and using information is in fact the authentic learning that modern education seeks to promote” (AASL, AECT, 1998, p. 2). Nevertheless, the order of presentation underlines the full evolution of the library media specialist from a provider of supplementary resources and services to an essential part of the school’s instructional team with a mandate to use both instructional design and instructional technology to enhance students’ learning.

18.6.2 The Information Literacy Standards for Student Learning

The second important innovation in the document is the inclusion of a mechanism intended specifically to help the library media specialist implement the “teacher” and “instructional

partner” roles. The Information Literacy Skills for Student Learning (ILSSL) are the core of *Information Power 2* and the first learning outcomes related to information use ever endorsed by the two national organizations that represent the library media field. The nine standards and 29 indicators presented in the ILSSL are intended to provide a conceptual framework for the library media specialist’s teaching of “information literacy”—the greatly expanded notion of “library skills”—and for integrating this key element of information-age learning throughout the curriculum. The schema begins with three standards related to basic information literacy, develops through three standards that foster independent learning with information, and culminates in three standards that relate to using information and information technology in socially responsible ways. The ILSSL are undoubtedly the most important contribution that *Information Power 2* makes to the school library media field.

Several features were designed specifically to make the ILSSL useful as tools to support the library media specialist’s instructional design role: the format in which they appear, the provision of suggestions for assessing their achievement, and the inclusion of direct links to standards from a variety of content areas to show their relevance to learning across the curriculum. First, the ILSSL reflect the typical instructional design approach of creating goals and objectives to structure and direct student learning. The first Standard, for example, is “The student who is information literate accesses information effectively”—a statement that describes an outcome at a broad, general level. This Standard encompasses five “indicators,” statements that detail specific outcome behaviors that lend themselves to assessment: for example, “Identifies a variety of potential sources of information” (Standard 1, Indicator 4; AASL & AECT, 1998, p. 11).

For each indicator, three levels of proficiency are suggested “to assist in gauging the extent to which individual students have mastered the components of information literacy.” Examples rather than specific assessment items, these statements “allow local teachers and library media specialists full flexibility in determining the amount and kind of detail that should structure student evaluations” (AASL & AECT, 1998, p. x). For Standard 1, Indicator 4, the levels are as follows:

Basic Lists several sources of information and explains the kind of information found in each.

Proficient Brainstorms a range of sources of information that will meet an information need.

Exemplary Uses a full range of information sources to meet differing information needs. (AASL & AECT, 1998, p. 11)

The format of the statements and the inclusion of suggestions for assessing students’ learning clearly give library media specialists a useful tool for designing information literacy instruction according to the concepts and principles of instructional systems design. Moreover, providing specific guidance but assuming more latitude than traditional objectives and assessment strategies often allow, the ILSSL are broad enough to encompass a variety of learning and evaluation activities that are both consistent with current learning theory and that call for the use of “the full range of communications media and technology” (AASL & AECT, 1998, p. 7).

Thus, the theory underlying the development of the ILSSL supports the library media specialist’s role in designing and implementing learning experiences that involve authentic tasks and that use a variety of technologies as “information vehicles for exploring knowledge to support learning-by-constructing” (Jonassen, Peck, & Wilson, 1999, p. 13). For example, comparing and contrasting commercial and public service ads to determine the kinds of information featured in each addresses an information issue of interest to many students and can involve the use of a comprehensive range of information technology—newspapers, magazines, radio, television, and the World Wide Web—as venues for learning. The ILSSL provide theoretical and practical guidance for melding the library media specialist’s instructional design and instructional/informational technology responsibilities.

18.6.3 Links to the Content Areas

The third aspect of the ILSSL that supports their use as an instructional-partnering tool is the provision of links between these statements of information literacy outcomes and the content area standards developed by various national educational groups in science, mathematics, geography, civics, English language arts, etc. Each of the ILSSL is accompanied by a series of outcome statements developed by these groups, over 80 of which—related to 14 content areas—were selected to highlight the connections between information literacy and learning in the content areas. Extracted from Kendall and Marzano’s *Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education* (2nd ed., 1997), the statements are linked with specific ILSSL to provide “a tool for library media specialists and teachers to use as they collaboratively design learning experiences that will help students master both disciplinary content and information literacy” (AASL & AECT, 1998, pp. x–xi). By offering guidance for linking information access, evaluation, and use specifically to the subject matter areas, this feature gives the library media specialist a clear and specific mechanism to use in approaching teachers, showing them the relevance of information literacy to achievement in their own content areas, and initiating the collaborative instructional design process envisioned by *Information Power 1* and 2.

One of the 11 content area standards provided for our example (ILSSL Standard 1) illustrates the utility of these statements for supporting the collaborative design of learning experiences that address both information literacy and content area expertise and that incorporate the meaningful use of technology as well:

Geography Knows the characteristics and purposes of geographic databases (e.g., databases containing census data, land-use data, topographic information). Standard 1, Grades 6-8 Indicator. (Kendall and Marzano, pp. 511, quoted in AASL & AECT, 1998, p. 13)

Armed with this standard and an ILSSL indicator that focuses on the importance of identifying the most appropriate sources for finding specific information on a topic, the library media specialist can readily collaborate with the middle school geography teacher to design, implement, evaluate, and revise interesting and authentic learning experiences that provide students an

opportunity to build their knowledge of geographic sources and their uses.

It may be that *Information Power 2*'s multiple supports for the library media specialist's instructional design function—its newly stated goals, its emphasis on the “instructional partner” role, and its inclusion of the Information Literacy Standards for Student Learning—will be the catalysts that finally enable library media specialists to become full partners on schools' instructional design teams. The potential is certainly in place: over 56,000 copies of the guidelines have been sold in over 24 countries (Robert Hershman, personal communication, March 11, 2002).

18.7 RESEARCH ISSUES FOR THE FUTURE

Now that *Information Power 2* has been available for 5 years, research should begin in earnest on its impact on the teaching-and-learning mission of library media programs and on the contributions those programs bring to student achievement (Neuman, 2003). Such research is clearly necessary. Despite the promising developments of the past decade, there are at present no data to suggest that library media specialists have stepped fully into the role of “an instructional designer from within” as envisioned over a decade ago (Gustafson, Tillman, & Childs, 1991). In fact, in their chapter on instructional design and technology in the schools published in 2002, Carr-Chellman and Reigeluth fail even to mention library media programs or library media specialists in their survey of various types of instructional design and technology initiatives in the schools. Even their recommendations—“building sincere coalitions with teacher groups, moving toward proactive relationships with teachers, and working to understand what teachers need from our field and what will be both useful and sustainable” (p. 251)—suggest a lack of awareness that such activities have been occurring through library media programs for over 20 years.

18.7.1 Understanding the Status of the Field: Too Little Done, Too Little Studied, Too Narrowly Communicated

There are many reasons for the lack of awareness of library media specialists' forays into instructional design and their contributions to learning in schools. One, surely, is the limited amount of integrated instruction and instructional consulting that is actually accomplished. Scholars in the field have lamented this situation for close to two decades (see, for example, Baumbach, 1991; Craver, 1986, 1990; Pickard, 1993; Putnam, 1996; Schiffman, 1987; Small, 1998b; Turner & Zsiray, 1990; van Deusen & Tallman, 1994). To this day, library media specialists with fixed schedules and fixed expectations on the part of principals and teachers often have little opportunity to engage in any instruction beyond teaching isolated classes in what are still too widely called “library skills.” Even a library media specialist fortunate enough to have a flexible schedule is often the only professional working in a school's library media center—with an astonishing

array of “librarian” responsibilities and little time for the kind of collaboration envisioned by the field. Those “consulting moments” that do occur are often silently folded into a larger context rather than trumpeted as a distinct and distinctly valuable role. Publicizing successful efforts is rarely a high priority in a hectic schedule.

Another reason for the lack of awareness of the library media program's role in student learning is undoubtedly the limited amount of research that has been conducted on the learning outcomes associated with library media programs and with the instructional efforts of library media specialists. Lance's (1994) observation that fewer than 40 studies had addressed these issues by the mid-1990s and that most of these had been conducted before 1979 is indeed sobering to anyone looking for solid evidence of library media programs' effectiveness in fostering learning. Some of this lack of research on outcomes reflects the limited amount of instructional consulting done in the past, some reflects the comparatively small size of the library media research community, and some seems to reflect the culture of librarianship—a commitment to providing free and unfettered access to information and a firm belief in guarding the privacy of all who use that information.

Growing out of this culture, library and information science (LIS) research has traditionally focused on improving access to information rather than on assessing any outcomes based on its use. Most LIS research on user needs—the closest analog to “learning” issues in the field—has traditionally been survey research (Wang, 1999). Only in 1999, for example, did the Association of Research Libraries begin its “Higher Education Outcomes Research Review” to “investigate strategies for assessing the library's value to the community and to explore the library's impact on learning, teaching, and research” (ARL, 2002). School library media research often follows this long-standing LIS research pattern—using survey and other descriptive methodologies to address the nature and extent of library media programs in schools, the adequacy of funding and collections of resources, the installation and use of networked resources, instances of censorship, the education of library media specialists, factors related to the implementation of the instructional consultant role, and other issues more closely related to providing “opportunities for learning” than to assessing any outcomes related to those opportunities.

A third reason for the lack of awareness of library media programs' value seems to be the library media field's own history and the compartmentalization of education in general and of educational research in particular: while the library media field has moved steadily toward a more complex and valuable instructional presence for decades, few outside the field are aware of the changes. Still seen as “only librarians” by many of their colleagues and generally ignored by researchers outside the library media community, library media specialists have not yet had substantial success in breaking out of their isolation from their fellow practitioners or into the attention of the larger body of educational researchers—all busy professionals who are themselves absorbed in the issues and concerns of their own immediate disciplines.

Moreover, library media researchers themselves have not addressed the issue successfully: talking about Didier's (1984)

“benchmark” review of research studies “intended to identify an association between school library media programs and student achievement,” Callison (2002) noted that

Tracing these studies 20 years later . . . reveals a problematic trend . . . in that none is published in respected educational research journals, few investigators published their findings beyond the initial dissertation, and an awareness of these collective findings seldom extended beyond the narrow school library research arena. (p. 351)

While this situation has improved somewhat, it is still true that library media research rarely finds its way into journals beyond the limited number devoted specifically to the field: “Until research strands reported here move into a broader educational research framework, it is likely that findings, no matter how dramatic or significant, will remain dormant without causing change” (Callison, 2002, p. 362).

The chief problems, then, in linking the library media program to student achievement are that too little has been done, too little has been studied, and what has been found has been too narrowly communicated. Can this situation be overcome? Can library media programs and the library media specialists responsible for them emerge as recognized contributors to student learning over the next decade? And can research, theory, and practice in instructional design and technology contribute to that emergence? Several promising elements are in place both to support such emergence and to chronicle its nature and effects. Perhaps never before in the history of the field has there been a better environment in which library media specialists can engage more fully in their instructional and instructional design roles and in which library media researchers can study the impact of those efforts and report their results to an interested educational research community.

18.7.2 A Partial Answer to “Too Little Done”

Underlying the factors that suggest a more prominent and visible instructional contribution for library media specialists are the societal and cultural changes that have affected schooling in general and library media programs in particular. Foremost among these, of course, is the World Wide Web. The Web epitomizes the merger of information, communication, and instructional technologies—a merger that has placed the library media program at the heart of one of modern education’s most important challenges: to determine how to use information and information technology for effective, meaningful teaching and learning. With teachers eager to find the “best” Web sites to enrich their teaching and students intent on importing Web-based text and visuals into their final products, today’s library media specialists often find themselves at the center of the instructional questions that are most pressing in the everyday life of their schools.

It is library media specialists’ responsibility to select, maintain, and provide instruction on how to use their schools’ electronic information resources—a responsibility that gives them greater opportunities than ever before to promote their instructional design and technology skills to affect learning, teaching,

and student achievement. Sought out for their expertise rather than seeking chances to provide it, today’s library media specialists are poised to collaborate in designing information-based instruction as a matter of course rather than as an add-on or an unwarranted distraction. Both conceptually and practically, it is a short step from helping students and teachers locate specific information to helping them use information and information resources in meaningful ways. Library media specialists—trained in both information skills and instructional design—have the knowledge and skills and now an unprecedented opportunity to take that step.

Another cultural and societal engine that is driving library media specialists to a greater focus on learning outcomes is the increasing national emphasis on student achievement, which grew as part of the movement toward developing national standards throughout the 1990s and culminated in the No Child Left Behind Act of 2001. Like all other educators, library media specialists are reexamining their programs and approaches to align them with state and national requirements to foster and demonstrate improved student performance. While the idea of assessing student learning is relatively new to library media specialists (see, for example, Kuhlthau, 1994; Neuman 2000; Thomas, 1999), the current national focus on accountability is encouraging library media specialists to be assessment partners with their teachers and thus—as a by-product—to set the stage for more research opportunities to delineate the relationship of library media programs to learning.

Opportunities, of course, cannot be confused with outcomes. There is certainly a possibility that the tsunami of the Web will overwhelm library media specialists with technical demands rather than spurring them to new heights of instructional and instructional design activity. Even with an increased emphasis on assessment, the field’s commitment to integrating information literacy into content instruction rather than treating it as a stand-alone curriculum makes it difficult to trace a straight line between the library media program and learning. Nevertheless, the Web has sparked unprecedented popular and educational interest in “educational technology,” and the national focus on accountability is finding its way into library media centers (see, for example, Grover, 1994; Grover, Lakin, & Dickerson, 1997). It seems likely at this juncture that researchers will soon find a much greater number of instances of library media specialists’ teaching, instructional partnering, and participation in stipulating and assessing student learning outcomes to use as the basis for studying library media programs’ contributions to student learning.

18.7.3 A More Extensive Answer to “Too Little Studied”

To take advantage of the research possibilities afforded by the increasing instructional and instructional design activities now available for library media specialists, library media researchers will need new conceptual frameworks to guide their investigations. Neuman (1997) has argued that the notion of “information literacy,” particularly as defined by the American Library Association, provides a compelling framework for such research

because of its close interweaving of learning and information studies:

To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. . . . Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning because they can always find the information needed for any task or decision at hand. (*ALA Presidential Committee Report*, p. 1, quoted in Behrens, 1994, p. 315)

This definition, which “makes explicit the link between information use and learning” and integrates “concepts inherent to learning with those essential to information use, suggests a theoretical structure that . . . anchors [the two fields] within [the] larger framework” of information literacy that provides a compelling rationale for studying the links between information use and learning and for determining the relationship of learning with information to student achievement (Neuman, 1997, pp. 703–704).

Within this framework, several approaches—outgrowths of long-standing views as well as approaches that have emerged in recent years—hold promise for guiding studies of library media programs’ contributions to student learning. For example, the field’s instructional models for teaching information-seeking skills—such as Eisenberg and Berkowitz’s Big Six Skills (1990), Joyce and Tallman’s I-Search Process (1997), Stripling and Pitts REACTS model (1988), and Pappas’ Pathways to Knowledge (1997)—lend themselves to research that will build on their implied focus on the learning that can occur as part of information seeking. Research designs that make that focus explicit and use it to undergird studies of how library media specialists use the models to foster learning through information seeking can test the models’ value as tools for learning. Since many library media practitioners and researchers are already familiar with one or more of the models, using them as the basis for such studies could be a reasonably straightforward way to address the issue.

In addition to the “traditional” information-seeking models that could be expanded to ground research on information seeking and learning, research related to several new instructional design models created specifically for library media specialists can extend knowledge and understanding of the relationship between learning and the instructional design role of the library media specialist. Turner’s new textbook, based on his original model, is slated for publication in 2003. A book based on Small’s IM-PACT model (Information Motivation—Purpose, Audience, Content, Technique) is also about to appear (Small, 2000a). Turner’s model has been a potent force in discussions of library media specialists’ instructional design role for some 20 years, and Small’s approach builds on her research agenda on motivation (see, for example, Small, 1998a, 1999, 2000b) to create a model in which “motivation theories and concepts inform and are integrated into” each of four design phases. “Based on principles of instructional design, industrial psychology, information science, and communications theory,” Small’s model

focuses on generating “information motivation”—that is, “interest and excitement for using information resources, services, and technologies to solve information problems, satisfy intellectual curiosity, and stimulate a desire to seek and gain knowledge” (Ruth Small, personal communication, September 11, 2002). Research conducted both to verify Turner’s and Small’s models and to determine their effectiveness in promoting the library media specialist’s use of the concepts and skills of instructional design could augment our understanding of library media specialists as instructional partners.

Chief among the tools that can focus studies of library media programs’ relationship to student learning, however, are the Information Literacy Standards for Student Learning (ILSSL) presented in *Information Power 2*. Designed both to “describe the content and processes related to information that students must master to be considered information literate” (AASL & AECT, 1998, p. x) and to “provide the basis for the library media specialist’s role in collaborative planning and curriculum development” (p. 63), these statements tie the field directly to learning and instruction as nothing has done before. Using them as a framework for structuring studies of their effectiveness—both as tools for planning and as measures for assessing the nature and extent of student learning—is an obvious research approach for the coming decade.

Case studies of how the ILSSL function as tools for collaborative planning and teaching—the processes and outcomes of using them to structure the library media specialist’s instructional-partnering role—could provide insights into the specific ways in which library media specialists contribute to sound instructional design and therefore to student achievement. Perhaps even more importantly, studies designed to measure students’ achievement related to each of the 29 indicators could provide specific evidence of the contributions of library media programs not only to students’ information literacy but to their mastery of content knowledge. These central components of *Information Power*—with their outcomes-based format, built-in guidelines for assessment, and links to a range of subject-matter areas—could prove central components in the field’s efforts to establish library media programs as essential to learning in the twenty-first century.

18.7.4 A Partial Answer to “Too Narrowly Communicated”

Changes in the way theorists and practitioners have come to view teaching and learning suggest that library media research that focuses on learning—and particularly on learning with the information that surrounds us in this “information age”—has a focus that could be of wide interest to the educational research community as a whole. Constructivist theory in particular has renewed and strengthened all educators’ understanding that learning is in fact a process and that this process is interwoven with a variety of the individual and contextual elements, including information in its various forms. Carey’s (1998) argument for designing information literacy instruction according to constructivist ideas makes explicit the connection between constructivism and information literacy.

The constructivist conception of learning is a comfortable fit for the library media field, which has long been associated with learning as a process rather than only an outcome: “Our content *is* process” is a frequent refrain among library media theorists and practitioners who see the field’s essential role as helping students master the processes of finding, evaluating, and using information. The long-standing and widespread popularity of Eisenberg and Berkowitz’s “Big Six Skills”—designated as skills “for information problem solving” (Eisenberg & Berkowitz, 1990)—provides evidence of the commitment of library media specialists to the view that their work goes well beyond attention to the specific content of a particular information-gathering effort.

Ironically, in some respects it seems almost as if education at large and instructional design in particular are catching up with the library media field’s views about learning with information. For example, Mayer (1999) defines learning in terms of information processing and uses this definition as the basis for his SOI Model for designing constructivist learning: “Constructivist learning depends on the activation of several cognitive processes in the learner during learning, including selecting relevant information, organizing incoming information, and integrating incoming information with existing knowledge. I refer to this analysis as the SOI model to highlight three crucial cognitive processes in constructivist learning: S for selecting, O for organizing, and I for integrating” (p. 148). While it is true that Mayer’s theoretical stance as well as his suggestions for encouraging students in each process reflect a focus that is somewhat different from the kind of learning with information that concerns library media specialists, his design of a model based on information use suggests a strong conceptual commonality between instructional design and library media. Indeed, Chung (2003) used it as part of the theoretical framework for her study of high school students’ use of library media resources for meaningful learning.

Similarly, Duffy and Cunningham’s (1996) six-step model for an undergraduate minor in “Corporate and Community Education” is based on the processes of information seeking and use and employs terms similar to the skills advocated by Eisenberg and Berkowitz (1990), including a central step in which students are instructed in the

Use of information resources. Given a learning issue, how efficiently can you use the variety of information repositories to identify and obtain potentially relevant information? This includes your ability to:

- Locate and acquire information or expertise from the library, experts, and using electronic resources like e-mail, World Wide Web, and Newsreaders.
- Reformulate your learning issue in a way appropriate to searching, using the particular information resource, i.e., ability to develop key words, restrict searches, identify related topics, etc. (Duffy & Cunningham, 1996, p. 192)

Although a model for university undergraduates rather than for the P-12 audience that library media specialists serve, Duffy and Cunningham’s steps clearly reflect the library media field’s orientation.

Mayer’s (1999) and Duffy and Cunningham’s (1996) models both suggest a commonality of research interests across age groups and even specific fields. The need to explore questions about “how students represent knowledge in their own minds at various stages of the information-seeking process, how they extract information from both textual and visual presentations and construct personal meaning from it, how they integrate various kinds of information into their own understandings, how they move from one level of understanding to another, and how information use supports the growth and development of students’ changing conceptual structures as they move forward along the novice-to-expert continuum” (Neuman, 2003, pp. 513–514) suggests parallel agendas for instructional design research in general, for library media research that focuses on learning with information, and for content area research addressed to understanding how the process of extracting information from content area databases and other resources can foster content learning. Although the caveat against mistaking opportunities for outcomes remains in force, it does seem that mutual interests in the many facets of learning with information suggest that researchers across a variety of fields might publish in one another’s journals to the benefit of all.

18.8 SUMMARY AND CONCLUSION

For over 40 years, library media specialists have been moving closer and closer to a full instructional role in the schools. Each new version of the field’s national standards and guidelines published during that period has advanced that movement, and instructional design models created especially for library media specialists have provided specific strategies and techniques to further its momentum. The linking of AASL and what would become AECT to prepare the 1969 standards and the resultant conceptual merger of the “library” and “audiovisual” aspects of the field in that document situated library media directly within the field of educational communications and technology. With the growing awareness of the library media specialist’s role as an instructional technologist and designer throughout the 1970s, leaders in library media began to call for formal training in instructional systems design as part of the preparation of library media specialists—a focus that culminated with the appearance of the “instructional consultant” role in *Information Power 1* in 1988.

Research tying the field directly to student learning is limited but suggests that library media programs have made a small but important contribution to student achievement over the years. While much of the field’s early research focused on “opportunities for learning”—sizes of collections, presence of certified staff, etc.—contemporary researchers are becoming more sensitive to the need to demonstrate library media programs’ effects on student learning. Since the early 1990s, research has been discovering and documenting this effect, and research into the concepts and strategies related to information seeking and learning from information has augmented our understanding of the ways in which students’ encounters with information and information resources affect their performance in schools.

The emergence of the library media specialist's instructional consulting/instructional partnering role over the last 15 years holds the key to forging and documenting the library media program's contribution to student learning and achievement. While a variety of factors have prevented individual library media specialists and the field as a whole from moving fully into an instructional design role, today's library media specialist—generally the one professional in the school with formal training in instructional systems design—is in an ideal position to adopt it. With the convergence of instructional, informational, and communications technology into the electronic resources that are the library media specialist's purview and teachers' newest instructional tool, library media programs have an unprecedented opportunity to contribute to student learning. As an information specialist, as a program administrator, and as a teacher and instructional partner charged with "ensur[ing] that students and staff are effective users of ideas and information" (AASL & AECT, 1998, p. 6), the library media specialist is in a unique position to engage students and teachers in authentic, information-based learning. The Information Literacy Standards for Student Learning provide an innovative and powerful tool for fostering that engagement.

Over 30 years ago, Joyce and Joyce (1970) became the first researchers in the library and information science field to explore children's use of information systems. Then, the focus was primarily on retrieval; today, it is on learning. Just as the library media specialist has an unprecedented opportunity to contribute to student learning, the library media researcher has an unprecedented opportunity to chronicle and report that contribution to a wide audience of educators who are interested in similar questions and issues. As Neuman (2003) notes,

Student learning is at the heart of the school library media field, and the question of how students learn with electronic information sources is one of the field's key research questions for the coming decade. . . . it is [these] interactive resources that hold the greatest promise for enabling students to engage meaningfully with information and to use it as the basis for developing sophisticated understandings of the world in which they live. Learning with information is the authentic learning that is sought by all educators today, and fostering learning with information is the library media program's central contribution to student learning and achievement. Research that explores students' learning with the emerging . . . electronic resources that will provide the richest venue for their learning throughout their lives should be a central focus of the field. (Neuman, 2003, p. 510)

Such a research focus would fuse the cultures of librarianship, instructional design and technology, and school library media in an important and unprecedented way. If the research and practice opportunities before the school library media field today do, in fact, become outcomes, Gustafson, Tillman, and Childs' (1991) goal could be met and library media programs could actually become the touchstone for instructional design and technology in the schools. Like that "black . . . stone used to test the purity of gold and silver," the library media program could become "a test or criterion for the qualities of [the] thing" (Urdang, 1968, p. 1389).

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